

The Thermo Scientific FHT 1377 PackEye is excellent suitable for the rapid detection and location of gamma emitting radioactive sources.

FHT 1377 PackEye

Radiation Detection Backpack



Key Features and Benefits

- High sensitivity plastic scintillation detector for fast response - true gamma dose rate (50 keV to 3 MeV)
- Natural Background Rejection (NBR) indicates artificial sources - no false alarm upon NORM and natural background changes
- High neutron detection sensitivity
- User friendly, simple LED status indication
- Unchallenged light weight of 6 kg
- Low power consumption - operation time 60-70 h

The FHT 1377 PackEye provides survey teams with a tool for effectively addressing the problems of orphaned sources, radiological contamination, and maliciously introduced sources.

By virtue of the proprietary NBR-technology (Natural Background Rejection) extremely low contributions of artificial gamma radiation are quickly detected, despite much larger fluctuations of the natural gamma background radiation. Thus alarm levels in the order of 1 $\mu\text{R/h}$ for SNM or heavily shielded industrial sources (dirty bombs) are achieved.



The NBR measurement method has been developed by Thermo Fisher Scientific, Erlangen (Germany) for extremely fast discrimination between natural and artificial gamma radiation. Worldwide, more than 2000 devices based on this technology are in use.

Unlike conventional spectroscopic based gamma identification systems, the systems using NBR do not require the presence and resolution of gamma spectral lines.

Because of this flexibility, NBR can also definitively distinguish artificial high energy beta sources and heavily shielded gamma ray sources from fluctuating natural background sources. NBR has a rapid response time.

Artificial gamma radiation sources are identified in seconds by operators with basic training levels. Presence of artificial gamma radiation is simply indicated by a red flashing light and an audible alarm.

In addition to the detection of artificial gamma radiation (percentage alarm) a sigma based net count rate gamma alarm is active as well. Within a preset count rate range this alarm level is constantly and automatically updated according to the present background level.

System components

The detection of neutron sources is performed with the help of 2 ea. He-3

tubes (2.5 bar, 770 cm³ active volume ea.). The sliding evaluation window with 100 ms update cycles allows the setting of a very low net alarm threshold level. A neutron source with an activity of 20,000 n/s can typically be detected in a distance of 3 m (10 ft), i.e. the neutron detection limit corresponds to the requirement for installed gate monitors!

Discrimination between artificial and natural radiation

In case of absence of detectable artificial gamma radiation, the green "nat" LED (E) is flashing slowly. The red "art" LED (D) light is blinking once artificial radiation is present. The presence of artificial radiation always triggers an alarm.

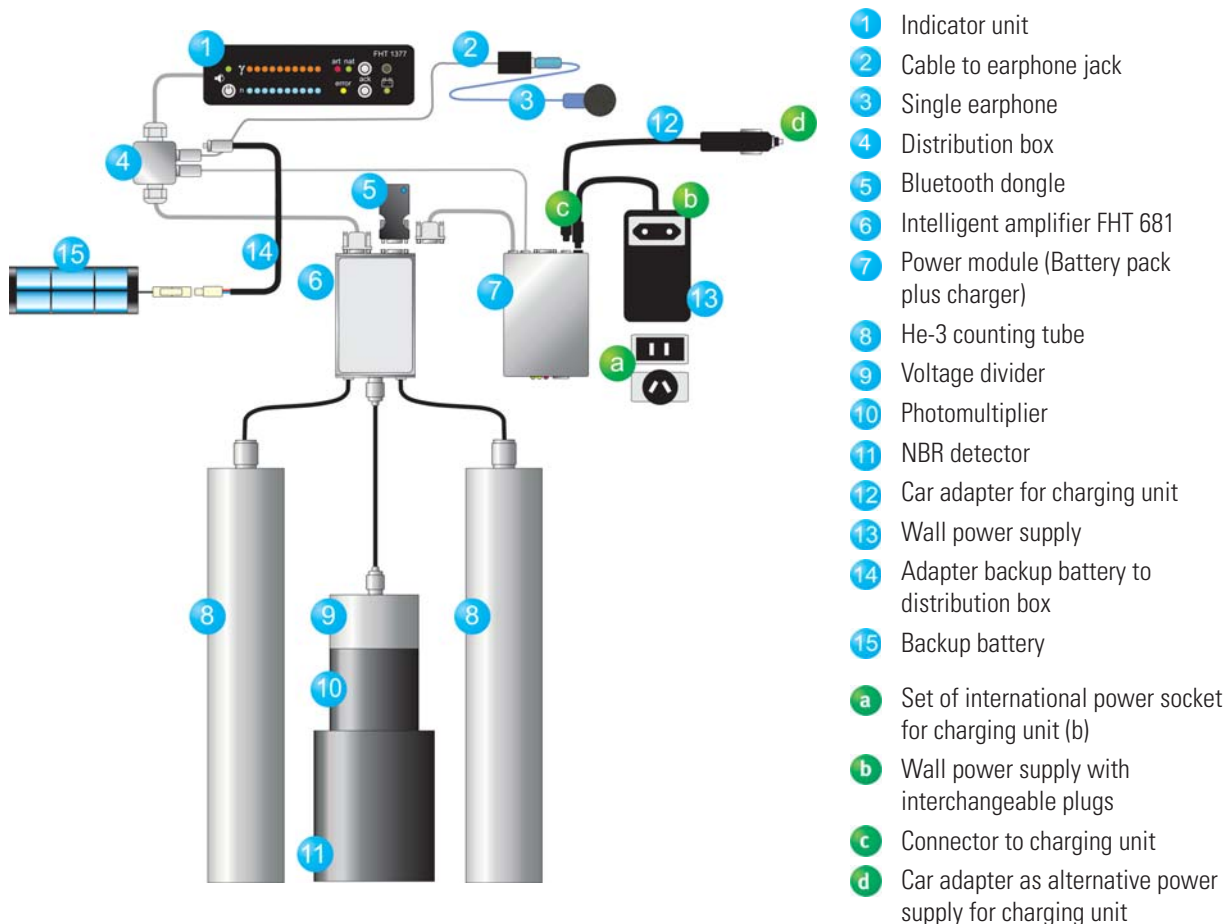
Excess of high energy radiation

If both LED lights (D + E) are on, the presence of an excess of high energy gamma radiation is indicated. Such an

unusual background energy distribution results in a slightly reduced NBR-sensitivity to SNM or shielded industrial sources and can be caused by large amounts of K-40, an AmBe source or N-16 radiation.

Alarm indication

Once an alarm had been triggered the location of the source can be traced by using the acoustical and / or LED bar indication. For stealth operation or in a noisy environment a standard earphone can be used. Optionally data display, alarm indication and data storage can be performed with the help of a PDA with Bluetooth™ communication.



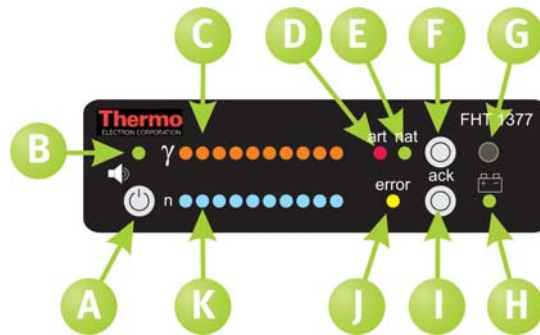
RadEye PRD - Personal Radiation Detector

For very low gamma energies the shielding effect of the user's body might hamper the detection of a source located in front of the user. It is therefore strongly recommended to wear an additional RadEye PRD at the belt. This pocket-sized instrument is an ideal complementary instrument for the precise localization of a source initially detected by the larger size FHT 1377.

RadEye PRD calibrated in R/h
4250671

RadEye PRD calibrated in Sv/h
425067120

Holster for RadEye PRD
425067046



Indicator unit display

- | | |
|--|--|
| A Push button on | G Sounder |
| B LED chirper Mode Indication | H LED battery status |
| C LED gamma radiation level bar | I Push button acknowledgement neutron radiation alarm |
| D LED artificial radiation | J LED system error |
| E LED natural radiation | K LED neutron radiation level bar |
| F Push button acknowledgement gamma radiation alarm | |

Interceptor™

For advanced isotope identification the Interceptor™ is available. The Interceptor offers immediate gamma isotope analysis.
INT Gid

Please ask for detailed datasheets!



Indicator unit

Stealth Operation:

The indicator unit can be hidden inside the backpack. The display of data as well as alarm indication is achieved through the optional PDA.



- 1** PDA
- 2** Radiation Detection Backpack
- 3** RadEye PRD
- 4** Indicator unit
- 5** Hidden radioactive material

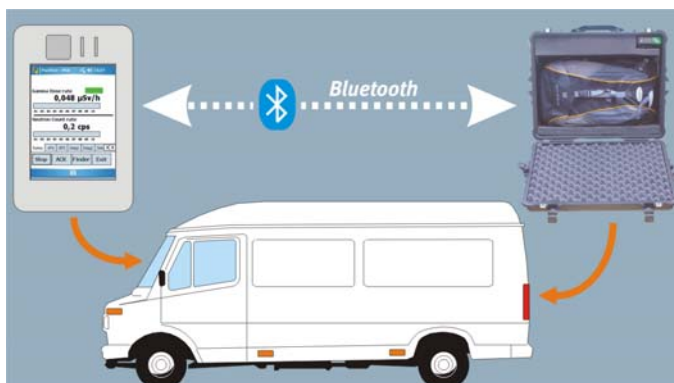
Versions:

Upon request, other backpack brands and models can be provided - weight and size will change accordingly.

FHT 1377 PackEye G - gamma only version
4255056



Application Example



FHT 1377 PackEye # 4255051

Scope of supply: 1 ea. light weight backpack containing radiation detection equipment¹, 1 ea. indicator unit mounted at the backpack's belt and 1 ea. accessory aluminium case².

¹ Comprising: 1 ea. NBR-Detector, 2 ea. He-3 tubes (2.5 bar), 1 ea. preamplifier and controller type FHT 681.

² Containing: 1 ea. user manual, 1 ea. USB connection cable with Driver Software, 1 ea. RS 232 serial connection cable, 1 ea. rain cover for backpack, 1 ea. earphone, 2 ea. rechargeable battery packs (one in exchange) for 60-70 h operation time each (378 g ea.), 1 ea. charger for 120/240 V AC and 12 V DC, 1 ea. package of black bands to secure the cables and belts of the backpack.

Accessories



PackEye Case # 4255085

Scope of supply: 1 ea. transport case for one PackEye (not included). The case allows the inside operation of a PackEye to be used as stationary detector. The PackEye can be powered externally by a case-adapter. It is recommended to use the optional PackEye PDA for data display as the indicator unit is hidden inside the case.

Tripod Stand # 4255086

Scope of supply: 1 ea. easily adjustable tripod stand with mounting plate for the PackEye case (not included).



PackEye PDA # 425505091

Scope of supply: 1 ea. Windows Mobile PDA including preinstalled software for data display and logging for retrospective analysis, 1 ea. plug-and-play Bluetooth adapter for the PackEye. The PDA has a built-in GPS system and class 2 Bluetooth capability.



Gamma Test-Adapter # 4254948:

(50 g natural Lu₂O₃); Immediate indication of artificial gamma alarm (NBR).



Case with PackEye inside

Technical Specifications

Gamma detector	NBR-detector FHZ 672 E (advanced version)
Gamma energy range / sensitivity	20 keV to 3 MeV / > 30 cps / µR/h [3000 cps / µSv/h] at 662 keV
Artificial gamma alarm	Typically better than 20 % of natural background
Neutron detectors	2 ea. He-3 tubes (2.5 bar), active length 15" ea., dia. 2"
Update	100 ms
Power supply	Rechargeable NiMH - power pack (7.2 V) - operation time 60-70 h
Total weight	Approx. 6 kg (approx. 13 lbs)

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